

# Creating a Market for Entertainment Video in VR - Steps to get from Here to There

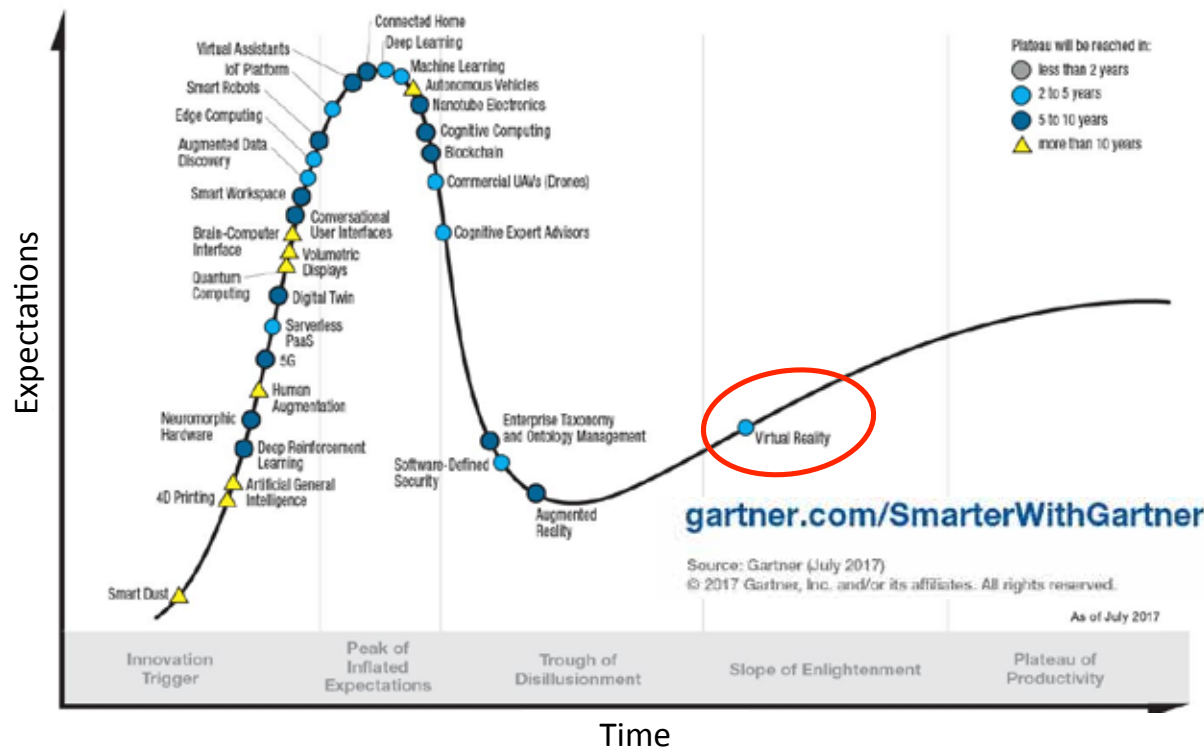


[www.vr-if.org](http://www.vr-if.org)

# Where are we today?



## Gartner **Hype Cycle** for Emerging Technologies, 2017



# Where are we today?



Source:  
BT Sport

# Where are we today?



Source: Netflix, Facebook, Sony, Hulu, FullMag

# Where are we today?



- First steps: VR360
- Video: Mono or Stereo
- Audio: Stereo or Spatial
- Very low resolution
- Limited (head) motion
- Large HMDs
- Market Fragmentation
- Consumer Confusion
- Poor Monetization



## Where are we headed?

- Full immersion - “six degrees of freedom”
- Real and computer-generated – and indistinguishable
- Immersive story-telling
- Enjoy an event as if you were there
- Enjoy it with friends



Source: HypeVR, Lytro

# What is required to get there?



## ▪ **Attractive Consumer Experience:**

- Great content
- Easy to use
- No side-effects
- Affordable
- Interoperable

## ▪ **Attractive Provider Proposition:**

- Broad Distribution Pipeline
- Based on Standards
- Secure & Sustainable



# What is required? – Standards, but...





# What is required? – Interoperability



# Mission VR Industry Forum



*To further the widespread availability of  
high quality audiovisual VR experiences,  
for the benefit of consumers*

- Non-profit organisation established during CES 2017, after a year of informal meetings

# Who Are We?





# GOALS & PRINCIPLES

# Goal – Creating a Market for 360VR



For consumers:

- **Make 360VR a high-quality, immersive, cross-platform experience**

For content producers & service providers:

- **Broaden reach and reduce cost caused by format proliferation (cost of production, distribution, etc.), secure content**

For device makers:

- **Ensure a wealthy, premium quality content pipeline**

For advertisers:

- **Drive the creation of a broad, unique & innovative sales channel**

# Principles



- Advocating voluntary **industry consensus** around common technical standards for the end-to-end VR ecosystem, from creation to delivery and consumption
- Advocating the creation and adoption of **interoperable standards** (VRIF will not develop standards itself); promoting the use of common profiles across the industry, and promoting and **demonstrating interoperability**
- Developing **voluntary guidelines** that describe best practices, to ensure high quality VR experiences

# What can VRIF do for you?



- **Enable an end-to-end premium content pipeline to consumers by:**
  - Ensuring UHD quality of experience
  - Making sure that underlying standards are relevant and interoperable
  - Adapting security systems to the special requirements of Virtual Reality
  - Investigating the “Human Factors” of VR experiences
  - Providing a neutral, cross-industry platform to discuss market needs
- **This is the basis for a sustainable market for virtual reality video**



# DELIVERABLES



# VRIF Guidelines



- Publish **Guidelines** by CES 2018
  - Production
  - Distribution
  - Security
  - Creation of Interoperability Points
- **Draft Guidelines** published during IBC 2017 for Industry Review
- **Lexicon** for common terminology
- Draft Guidelines and Lexicon now available at [www.vr-if.org](http://www.vr-if.org)

Draft Guidelines

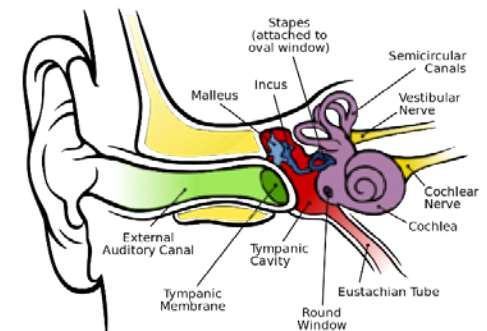
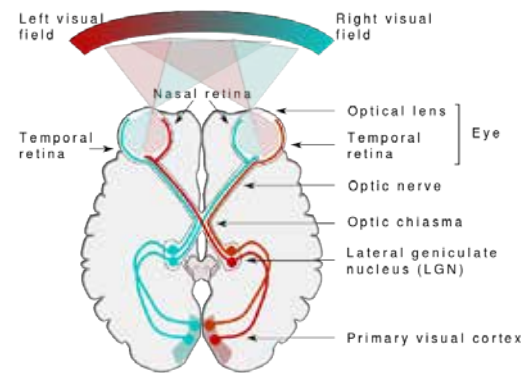
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# Human Factors



- Human Factors that impact the VR experience
  - Physiological (eye/human visual system, ear/human auditory system)
  - Physio-cognitive (motion sickness, sensory conflicts)
  - Psycho-cognitive (presence, realism of immersion, interaction)
  - Psycho-social (violence, addictions, etc.)



Source Pictures: Wikipedia/Wikimedia

# Production



- How to produce immersive quality content
- Started from SKY's "Technical Guidelines"
- Technical recommendations (capture, recording, resolution, immersive audio, storage and exchange formats, frame rates ...)
- Incorporating results of human factor studies (cuts, motion, etc.)
- Content Exchange Metadata



# Distribution



- Based on “OTT Download and Streaming” cases, Live coming soon
- Guidance and recommendations to implement VR video and audio profiles from MPEG OMAF (“Omnidirectional Media Format”)
  - Viewport Independent media profile → Stream Everything
  - Viewport Dependent media profile → Focus on Viewport
  - 3D Audio media profile based on MPEG-H Audio
- Configuration of packing, projection and supporting metadata
- Use of Adaptation Sets for MPEG DASH based streaming

# Security

- High quality VR productions can be very expensive to make, and need to be able to be monetized
- In practice, this means content protection
- Starts from MovieLabs Enhanced Content Protection spec; looks at what's the same for VR, and what's different
- Clear challenge: secure pipeline that includes rendering step
- Another challenge: securing privacy-sensitive data, preventing against “nausea attacks”



# VRIF's Potential Future Activities



- Conduct interoperability tests
  - Provide test tools and processes for end-to-end interoperability
  - Collect content that can be used for testing and experimentation
- Look beyond 360 3DoF toward 3DoF+ and 6DoF
- Investigate potential of HDR and HFR for VR Video
- Broaden and deepen the membership base
- Future activities are driven by members – Come and Join us!

[www.vr-if.org/join](http://www.vr-if.org/join)

# Upcoming Events



- **3GPP & VRIF WS on Virtual Reality Ecosystem & Standards**
  - Date: December 4-6, 2017
  - Location: Ericsson Campus Santa Clara, CA
  - \$50 participation fee, call for speakers still open
  - Confirmed speakers include Oculus, Qualcomm, Verizon, Orange, Baobab
  - Register at <http://www.vr-if.org/bin/c5i?mid=5&rid=6&k2=6>
- **VRIF 6DoF Mixer**
  - Date: December 6<sup>th</sup>, 2017, 3-5PM PDT
  - Location: Ericsson Campus Santa Clara, CA
- **VRIF F2F**
  - Date: December 7-8, 2017
  - Location: Ericsson Campus Santa Clara, CA

# Membership Levels



## Associate Members – \$1,000 / year

- Open to SME (annual revenue less than \$10 million), academia, consultants
- Voting participation in Working Groups
- Participate in promotional activities; be listed on the VRIF's website

## Contributor Membership – \$4,500 / year

- Be listed as a Contributor Member in all press releases of VRIF
- Vote in Board of Director elections

## Charter Membership – \$10,000 / year

- Stand for Election / Nominate representatives for Board of Directors
- Be listed as a Charter Member in all VRIF press releases and events





**THANK YOU**



**[WWW.VR-IF.ORG/GUIDELINES](http://WWW.VR-IF.ORG/GUIDELINES)**